

TODILTO EXPLORATION AND DEVELOPMENT CORPORATION

TEDCO

G. WARNOCK  
PRESIDENT

April 26, 1976

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U. S. Geological Survey  
Carlsbad, N.M.

Mr. D. R. Stewart  
U. S. Department of the Interior  
Geological Survey  
P. O. Box 1716  
Carlsbad, New Mexico 88220

Attention: Mr. G. A. Edwards

ADDENDUM TO EXPLORATION PLAN FOR ALLOTTED INDIAN LAND MINING LEASE  
N00-C-14-20-5681

Dear Mr. Stewart:

Submitted herein is an addendum to the Exploration Plan for Navajo allotted land located in Section 13, T13N, R11W covered by Uranium Mining Lease Contract No. N00-C-14-20-5681, which was submitted to you on April 9, 1976. Enclosed is a copy of Map. No. 103-007-015-T-2 showing Warnock and Todilto Leases along with existing mine workings.

The drilling plan, as submitted, outlines 104 planned exploration drill holes. Currently the Office of Contract Archaeology at the University of New Mexico is carrying out an inspection of the 160 acre Warnock Lease in order to determine the presence of surficial archaeological manifestations. Road and drill site locations may be altered somewhat pending outcome of the archaeological clearance.

The purpose of the drilling is to extend and delineate the uranium reserves around Todilto's Haystack Mine operation as indicated on Map No. 103-007-015-T-2. Mineral rights to the SE 1/4, S 1/2, N 1/2 of Section 13 are owned by the Energy Research and Development Administration of the United States Government. The surface rights are reserved for the use of the Navajo Nation by Public Land Order No. 2193 of August 26, 1960. Additionally, outside of--but adjacent to--the ERDA lease, Todilto holds mineral rights to the SW 1/4 of Section 13 and N 1/2, NW 1/4, Section 19, T12N, R11W by lease from the Santa Fe Pacific Railroad Company. Ore grade material is currently being mined on all of these leases on a continual basis. Last year's total ore reserves totaled 19,369 tons containing 110,791 lbs. of U3O8.

Physiographically, the area is in the Colorado Plateau province. The most prominent feature in the area is Haystack Mountain which has a maximum elevation of 7,833 feet and is a flat topped, elongated mesa standing well above the surrounding plain. This plain varies in elevation from 6,700 to 6,900 feet at the base of Haystack mtn. The topography is precipitious with many cliffs formed around the benches and mesas.

The lower parts of the drilling area are sparsely covered by various grasses, whereas junipers grow in some of the higher parts of the bench. The climate is semi-arid. The average annual precipitation is about 12 inches, occuring mostly as rain in July and August.

Wildlife consists of a few rabbits, rattlesnakes, lizards, with an occasional coyote or bobcat. No permanent damage is expected to result to these habitants or their natural environment.

The land is used locally by the Indian owners for grazing. Portions of the area have been fenced off for livestock control, and the homestead of Mary V. Delgarito is completely fenced in. This homestead is the only domicile in the lease area, and their homestead is shown on the enclosed Map No. 103-007-015-T-2 (shaded in blue.)

Figure 3 and Table 2 are general stratigraphic cross sections for the vicinity of Haystack Butte.

All drill holes will be collared in either one of the Morrison formation members or in the Bluff or Summerville formations of the San Rafael group. No water aquifers are expected to be encountered in the drilling. However, if water is encountered, a cement plug will be implemented for water conservation. Only the Westwater Canyon member of the Morrison formation can be considered to be a potential aquifer. A brief description of the geologic formations to be penetrated are as follows:

Morrison Formation -

Brushy Basin member: greenish-gray mudstone and local thick arkosic sandstone units

Westwater Canyon member: light-brown to gray, poorly sorted, arkosic sandstone and interbedded gray mudstone

Recapture Creek member: distinctive alternating beds of gray sandstone and grayish-red siltstone or mudstone

Bluff Sandstone Formation -

Pale red to brown, medium-grained sandstone where exposed on Haystack and is distinctly crossbedded

/Summerville Formation -

Interbedded red to white mudstone, siltstone, and fine-grained sandstone. The basal portion contains irregular limestone lenses

Todilto Limestone Formation -

Gray to whitish, massive to platy limestone with occasional carbon trash horizons. Silt and fine-grained sandstone lenses are present locally

The primary hosts for uranium mineralization are the Westwater Canyon member of the Morrison formation and the Todilto limestone formation. However, only a few holes will penetrate the Westwater Canyon formation. All drill holes are expected to bottom a few feet into underlying Entrada sandstone.

Structurally, beds generally dip from 3 to 5 degrees northeast. Minor east-west and northeasterly trending normal faults displace beds from 3 to 35 feet locally. No geologic hazards, such as toxic or explosive gases, are known to exist and no unusual conditions are expected.

The average width of the proposed roadway shall be 18 feet and a D-7-F bulldozer shall be utilized in construction of the roadway.

It is anticipated that approximately 2 3/4 acres of land shall be disturbed by the road construction and approximately 2 acres shall be disturbed by drill site construction.

The sole homestead in the area is owned by Mary V. Delgarito and comprises approximately 1/2 acre of fenced off land as indicated on the enclosed lease map 103-007-015-T-2 (shaded in blue). Prior consent shall be obtained from the owner prior to any drilling in the immediate area of the Delgarito homestead according to the provisions of the lease.

Two truck mounted Fayling 1000 rotary drill rigs shall be utilized for the drilling along with two 2.5 ton water trucks and two driller's pickup trucks. In addition, two geological field vehicles will be operating in the area.

Mr. D. R. Stewart  
Department of the Interior

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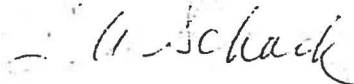
Grading and leveling shall be required on a few of the drill sites. A D-7-F bulldozer shall be utilized for drill site construction. It shall not be necessary to construct any mud pits. In the event mud is required in the drilling, metal mud tanks shall be utilized. In the event a water body or water-bearing stratum is penetrated, the hole shall be sealed with drilling mud or cement slurry according to the State Engineer's specifications.

Noise level readings have not been taken for the drill rigs pending purchase of noise level equipment and reporting of drill rigs to the job site. Readings are expected to range from 75 to 90 decibels. The drilling crews shall work 8 hour shifts and shall not be subjected to maximum noise on a continual basis.

All trash and debris shall be transported from the lease area and disposed of in the covered land fill dump at the Haystack Mine.

Water bars shall be constructed on access roads to control erosion. Each drill site shall be leveled, contoured, and reseeded with grass according to recommendations made by the Lessor and the Area Director.

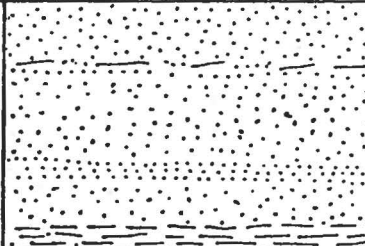
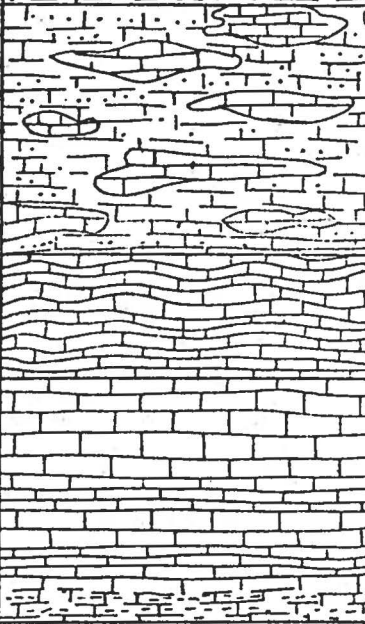
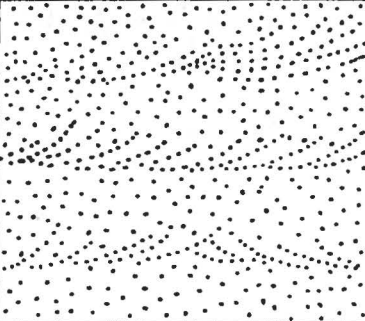
Very truly yours,



T. A. Schack

TAS/cc

Enclosures

Age	Formation	Unit	Lithology	Columnar Section
JURASSIC	Summer-ville formation		Reddish-brown sandstone, massive to thin bedded, fine, grained, well sorted, fluvatile.	
			Pale grayish-green mudstone	
	Todilto limestone	intertonguing zone	Light gray siltstone and sandstone with limestone lenticules; sandstone is fine-grained, massive, and calcareous; limestone is light and medium gray, massive, and very coarse-grained.	
		"crinkly" (recrystallized) zone	Mottled medium and dark gray limestone; thin crenulated bedding highly recrystallized coarse-grained, local silty lenses.	
		platy zone	Thick-bedded gray limestone.	
			Light to medium gray, alternating thick and thin bedded, very fine-grained dense limestone.	
	Entrada sandstone		Sandy limestone.	
			Reddish-brown sandstone, fine-to medium-grained, well sorted; uppermost five feet bleached white; eolian cross bedding.	

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7 feet

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Figure 3. Stratigraphy of the Todilto limestone and portions of adjacent formations in the vicinity of Haystack Butte, Mc Kinley County, New Mexico

System	Series	Group	Formation	Rock Type	Thickness (Ft.)
Quaternary	Recent and Pleistocene			Sand, gravel, loess	0-100
				Cinders, basalt	0-200
Cretaceous	Upper	Mesaverde	UNCONFORMITY Gallup sandstone	Sandstone	60-120
			Mancos shale	Shale	850-900
			Dakota sandstone	Sandstone, shale, coal	50-100
	Lower				
Jurassic	Upper	Morrison fm.	UNCONFORMITY Brushy Basin mbr.	Mudstone, siltstone, ss.	45-100
			Westwater Canyon mbr.	Sandstone	125-185
			Recapture mbr.	Siltstone, mudstone	125-245
		San Rafael	Bluff sandstone	Sandstone	100-300
			Summerville formation	Sandstone, siltstone, shale	150-200
			Todilto limestone	Limestone	25-35
			Entrada sandstone	Sandstone	135-150
			Carmel formation	Sandstone, siltstone	35-50
			UNCONFORMITY		
Triassic	Upper	Glen Canyon	Wingate sandstone	Sandstone	110-120
			Chinle formation	Mudstone, siltstone, sandstone, conglomerate	1200-1600
	Lower and Middle(?)		UNCONFORMITY Moenkopi formation	Siltstone, mudstone	25-50
Permian	Leonard		UNCONFORMITY San Andres limestone	Limestone, sandstone	95-130
			Glorieta sandstone	Sandstone	200-375
			Yeso formation	Siltstone, sandstone, mudstone, limestone	850-1000
	Wolfcamp		Abo formation	Siltstone, sandstone, conglomerate	600-650
Pennsylvanian(?)				Conglomerate, arkose, sandstone, shale, limestone	0-150
Precambrian			UNCONFORMITY	Granite, gneiss, metarhyolite, schist	

After W. L. Chenoweth

Table 2. Stratigraphic chart, Haystack Butte and vicinity, northeast flank of the Zuni Uplift, New Mexico

EXPLORATION PLAN  
NAVAJO ALLOTTED LANDS  
SECTION 13, T13N, R11W

I. EXPLORATION AREA:

<u>Tract No.</u>	<u>Contract No.</u>	<u>Anniversary Date</u>	<u>Description</u>
170	N00-C-14-20-5681	10/23/75	N 1/2, N 1/2, Sec. 13, T13N, R11W

II. STATEMENT OF INTENTIONS:

To drill 104 holes to an average depth of 130'

III. ANTICIPATED AREA DISTURBED:

Approx. 4 3/4 acres

Sites 0.1 acre per site = 2 acres

Road Construction (for access) = 2 3/4 acres

Will drill along existing roads and trails  
where possible

IV. REQUIRED MAPS

One copy of base map, Sec. 13, Scale 1" = 200', with proposed locations marked.

Submitted this 26th day of April 1976